“DOES PRETREATMENT CYSTOSCOPY IMPROVE STAGING IN CARCINOMA CERVIX? A PROSPECTIVE STUDY”

“Does Pretreatment Cystoscopy Improve Staging in Carcinoma Cervix? A prospective study”

A dissertation submitted to The Dr. M.G.R. Medical University, Tamilnadu, in partial fulfillment of the requirements for M.Ch. Branch-IV (Genitourinary surgery) examination to be held in August 2010.

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Certificate

This is to certify that the work incorporated in this dissertation entitled "**Does Pretreatment Cystoscopy improve Staging in Carcinoma Cervix? A prospective study"** is a bonafide work done by Dr. Joseph Paul K in partial fulfillment of the rules and regulations of MCh Branch IV (Genitourinary Surgery) examination of the Tamil Nadu Dr. MGR Medical University, Chennai to be held in August 2010.

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CONTENTS

INTRODUCTION

Carcinoma of the cervix is one of the commonest malignancies among women in India. About 1, 00,000 women are diagnosed with cervical cancer each year. [1] An accurate pre-treatment staging of cervical cancer is critical, as it determines the therapeutic approach. The International Federation of Gynecology and Obstetrics (FIGO) in collaboration with the World Health Organization (WHO) and the International Union against Cancer (IUCC) established the most commonly used staging system for cervical cancer [2]. FIGO guidelines allow the following examinations for establishing the stage of disease, but it is not mandatory to perform all of these tests on every patient [3]. Palpation and inspection of the primary tumor, palpation of groin and supraclavicular lymph nodes , colposcopy , endocervical curettage, conization, hysteroscopy, cystoscopy, proctoscopy, intravenous pyelogram (IVP) and radiographic examination of the lungs and skeleton. Women in resource-poor countries, which have a high prevalence of cervical cancer, generally do not have access to advanced imaging modalities and specialized surgical care, and the majority of patients are treated with primary radiation.

After histologic confirmation of invasive cervical cancer, the extent of disease needs to be determined. Two staging systems are available, both of which use clinical criteria to assign disease stage. As with all gynecologic cancers, tumor

stage is determined at the time of primary diagnosis and is not altered, even if disease recurs.

Cystoscopy is necessary to establish the diagnosis of bladder invasion by cervical carcinoma. However, it is an invasive investigation and may cause patient discomfort. Different studies [5,6,7] have assessed the usefulness of cystoscopy in comparison to to imaging modalities (ultrasonogram and CT scan). They have concluded that cystoscopy is required in select group of patients only.

Transabdominal sonography is a first-line imaging technique for evaluation of the upper and lower abdomen because it s almost universally available, is noninvasive, lacks ionizing radiation, and is well accepted by patients. Studies focusing on sonography as a diagnostic tool for focal bladder wall abnormalities (FBWAs) are scant. Most of these studies were retrospective, sometimes conducted in small cohorts of patients, and all were carried out with old sonography equipment[1].

With the invention of imaging modalities with advanced technology, the yield has considerably improved. In few studies available, comparison between CT

scan and cystoscopy, as well as transvaginal ultrasonogram and have been done. But studies comparing transabdominal ultrasound and cystoscopy are limited.

In this context, our attempt was to prospectively assess the usefulness of transabdominal ultrasonogram in the staging of cervical carcinoma to detect bladder mucosal infiltration and to compare with cystoscopy. This will help to select the patients for cystoscopy so that a routine invasive procedure can be avoided.

AIM

The aim of this study was to assess the usefulness of cystoscopy in staging of carcinoma cervix and to determine the potential of transabdominal ultrasonography to demonstrate the presence or absence of bladder infiltration in patients with cervical carcinoma.

REVIEW OF LITERATURE

The pretreatment assessment of cancer extension is extremely important for prognosis estimation and treatment planning. Additionally, a well-defined initial assessment enables the comparison of cancer treatment results among institutions or different treatment methods. The International Federation of Gynecology and Obstetrics (FIGO) provides a global staging system for gynecologic cancers . Most clinicians use this staging system in the treatment of uterine cervical cancer. The system describes the rules for stage classification in detail, and the permitted diagnostic procedures are clearly stated. However, some of the procedures included, such as intravenous urography, and skeletal X-rays, could be considered outdated. Although tumor diameter and pelvic nodal status are not accounted for in the FIGO staging system, they are estimated to be the important prognostic factors for cervical cancer. In several studies, tumor diameter as assessed by MRI was a significant prognostic indicator for patients with cervical cancer. Evaluation of pelvic or para-aortic lymph node status with optional imaging studies, such as CT, MRI, and lymphangiograpy, may also be useful for predicting prognosis (6).

3.1 Epidemiology

Carcinoma of the cervix is the 6th most common malignant neoplasm in human after carcinoma breast, lung, colorectal, endometrial and ovary. It is the second leading cause of female cancer deaths in the underdeveloped countries [9].[i]Carcinoma cervix is more common in women who had first intercourse at an early age, have a history of promiscuity and large number of pregnancies [10,11,12]

The peak incidence for invasive cancer is between 45 and 50 years of age, although there has been a rise in the 25–34-year age range. The peak incidence of CIN is 25–40 years of age. Currently, the mortality rate from cervical cancer is falling by almost 7% annually, which has been attributed mainly to the success of the cervical screening programme. Squamous cell carcinoma accounts for the majority of cases of invasive cervical cancer although, since 1998, there has been a significant rise in the proportion of cases of adenocarcinoma and adenosquamous carcinoma.

The most common type of invasive cancer of the cervix is squamous cell carcinoma, with subtypes, papillary (squamotransitional) subtype, the verrucous subtype and the lymphoepithelioma-like subtype [13].

Various aetiological factors have been associated with cervical cancer. Among these are human papillomaviruses (HPVs), smoking, sexual behaviour, immunosuppression (such as women who are HIV-positive and women undergoing renal transplant who are taking immunosuppressants) and combined oral contraceptive pills. There is now overwhelming evidence that HPVs are the main cause of both preinvasive and invasive squamous cell carcinoma of the cervix in nearly 100% of cases. s

3.2 Clinical presentation

Early invasive carcinoma of the cervix can be detected before it becomes symptomatic by cytological smears. Serosanguinous or yellowish, foul-smelling vaginal discharge may be noted in patients with invasive carcinoma, particularly with more advanced necrotic lesions. If chronic bleeding occurs, the patient may complain of fatigue or other symptoms related to anemia.

Pain, usually in the pelvis or hypogastrium, may be noted and could be caused by tumor necrosis or associated pelvic inflammatory disease. Some patients may complain of pain in the lumbosacral area, and in these cases the possibility of paraaortic lymph node involvement with extension in to the lumbosacral roots or hydronephrosis should be considered. Occasionally epigastric pain may be caused by metastasis to high para-aortic lymph nodes. Urinary and rectal

symptoms (hematuria, rectal bleeding) may appear in advanced stages as a consequence of invasion of the bladder or rectum by the neoplasm [14].

3.3 Staging

Meticulous staging of cervical cancer is important in determining the most appropriate form of treatment, as well as being a prognostic indicator. It is also valuable in comparing therapy results.[2]. Staging is based on clinical evaluation.Apart from stages Ia1 and Ia2 (where histological diagnosis is usually made from a cone or loop cervical biopsy, depending on the depth and horizontal extent of the disease), staging of cervical cancer is clinical, preferably by examination under anaesthesia by an experienced clinician. Thereafter, the stage should not be altered because of subsequent findings. The International Federation of Gynecology and obstetrics (FIGO) recommends that if there is any doubt as to which stage a particular cancer should be allocated, the earlier stage is mandatory[2].

The prognosis of cervical carcinoma is primarily determined by the stage of disease, the volume of the primary tumor, and the histologic grade. The current staging system for cervical cancer is based on the FIGO classification. It defines the clinical staging system for cervical carcinoma based on clinical assessment including physical examination under anesthesia, colposcopy, endocervical

curettage, hysteroscopy, cystoscopy, proctoscopy, IVU, Barium enema, and X-rays of lungs and skeleton. Errors in clinical FIGO staging have been reported. When compared with surgical findings, FIGO staging errors are 28% in stage Ib disease and 50%-64% in stage IIa-IIb disease. Clinical evaluation underestimates the surgical stage in 15%-36% of patients. In clinically staged Ib disease, underestimation of tumor extent occurs in 21% and overestimation in 6% of patients. Inaccuracy in clinical staging is predominantly due to difficulties in evaluating parametrial and pelvic sidewall invasion, bladder or rectal wall invasion, metastatic spread, and in evaluating primary endocervical (endophytic) tumors. Aside from the inaccuracies 8 of 14 of clinical staging, evaluation of lymph node metastasis, which is an important prognostic factor and a determinant in treatment planning, is not included in the clinical staging system. In surgically treated stages Ib and IIa cervical cancer, survival rates decline from 85%-90% to 50%-55%, respectively, in the presence of metastatic lymph nodes. In spite of these limitations of clinical FIGO staging, modern cross-sectional imaging modalities such as US, CT, and MRI have not been incorporated into clinical staging. Among the most common arguments against the use of CT or MRI as staging tools are their high cost and unavailability universally.

Cystoscopy is performed to exclude bladder involvement and a rectovaginal examination should be performed to determine the tumour bulk and the

presence of any parametrial or pelvic sidewall extension.[2] In women selected for surgery, adjuvant radiotherapy increases the risk of complications so should be avoided if possible. Accurate staging should, therefore, be obtained before commencing definitive therapy. Surgery or radiotherapy may be used as the primary treatment or in combination, although definitive surgery is usually limited to women with early-stage cervical cancer in whom radiotherapy may be avoided.[2]

Bladder involvement caused by local infiltration by cervical carcinoma has important therapeutic and prognostic implications. Evaluation of the bladder for infiltration is therefore an integral part of the clinical staging procedure. Cystoscopy, supported by cystoscopically directed biopsy is the only investigation accepted by FIGO as the gold standard for the diagnosis of bladder infiltration. [5]

3.3.1 FIGO staging of cervical cancer

Staging of Carcinoma of the uterine cervix is staged and managed by means of the International Federation of Gynecology and Obstetrics (FIGO) staging system. The FIGO staging system is determined preoperatively mainly by the

clinical assessment. This was seen to be quit sufficient for early stage disease, but it has inherent inaccuracies in advanced stage disease. It does not take into account the nodal involvement. Though not routinely used in the developing countries, CT and MR imaging are widely used elsewhere to evaluate tumour size and extent, and nodal involvement. In this it was found that MR imaging is excellent for depicting invasive cervical carcinoma with objective measurement of tumour volume. It rules out conclusively parametrial invasion and stage IVA disease [15].

Invasive cervical cancer may spread to the lower urinary tract by direct invasion. Examination of the ureters and bladder is very important in evaluating the extent and spread in cervical cancer. The two methods most commonly used in the evaluation of the urinary tract in cervical cancer patients are excretory urography and cystoscopy.

In the FIGO staging of cervical cancer, excretory urography has been considered an integral part of the initial evaluation because the presence of hydronephrosis or nonfunctioning kidney resulting from ureteral obstruction advances the staging to 3B and is of prognostic importance. Several studies have showed that the accuracies of excretory urography, CT and MRI in the

detection of urinary tract obstruction are similar. Therefore, it is not necessary to perform excretory uogram when CT or MRI are done.

The use of FIGO permitted examinations (e.g. intravenous urography, cystoscopy, and proctoscopy) is gradually decreasing in the USA [32,33]. In a 2000 –02 US study on the pretreatment evaluation of patients with stage IIB or less disease, the rates for performing intravenous urography, cystoscopy, and proctoscopy were 1, 16, and 17%, respectively [33]. In contrast, the present study demonstrated that these exams were performed frequently even for early stage cases in Japan. Schmitz et al. [34] proposed that since the likelihood of upstaging using these examinations was very low in clinical stage IB patients, these exams could be omitted in those with stage IB disease. Now, the National Comprehensive Cancer Network (NCCN) guideline states that cystoscopy and proctoscopy are optional exams for the pretreatment assessment of cervical cancer patients with a disease stage of IB2 or higher.

Classification Criteria (FIGO/UICC 1997)

TNM	FIGO	
TX		Primary tumour cannot be assessed

T0		No evidence of primary tumour
TIS	0	Carcinoma in situ (preinvasive carcinoma)
T1	I	Cervical carcinoma confined to uterus (extension to corpus should be disregarded)
T1a	IA	Invasive cancer identified only microscopically. All gross lesions even with superficial invasion are stage T1b/IB cancers.
T1a1	IA1	Stromal invasion no greater than 3.0 mm in depth and no wider than 7.0 mm
T1a2	IA2	Measured invasion of stroma greater than 3.0 mm and no greater than 5.0 mm with horizontal spread 7.0 mm or less
T1b	IB	Clinical lesions confined to the cervix or microscopic lesion greater than T1a2/IA2
T1b1	IB1	Clinical lesions not greater than 4.0 cm

		in size
T1b2	IB2	Clinical lesions greater than 4.0 cm in size
T2	II	Tumour invades beyond uterus but not to pelvic wall or to lower third of the vagina
T2a	IIA	Without parametrial invasion
T2b	IIB	With parametrial invasion
T3	III	Tumour extends to pelvic wall and/or involves lower third of vagina and/or causes hydronephrosis or non-functioning kidney
T3a	IIIA	Tumour involves lower third of vagina, no extension to pelvic wall
T3b	IIIB	Tumour extends to pelvic wall and/or causes hydronephrosis or non-functioning kidney
T4	IVA	Tumour invades mucosa of bladder or rectum and/or extends beyond true pelvis

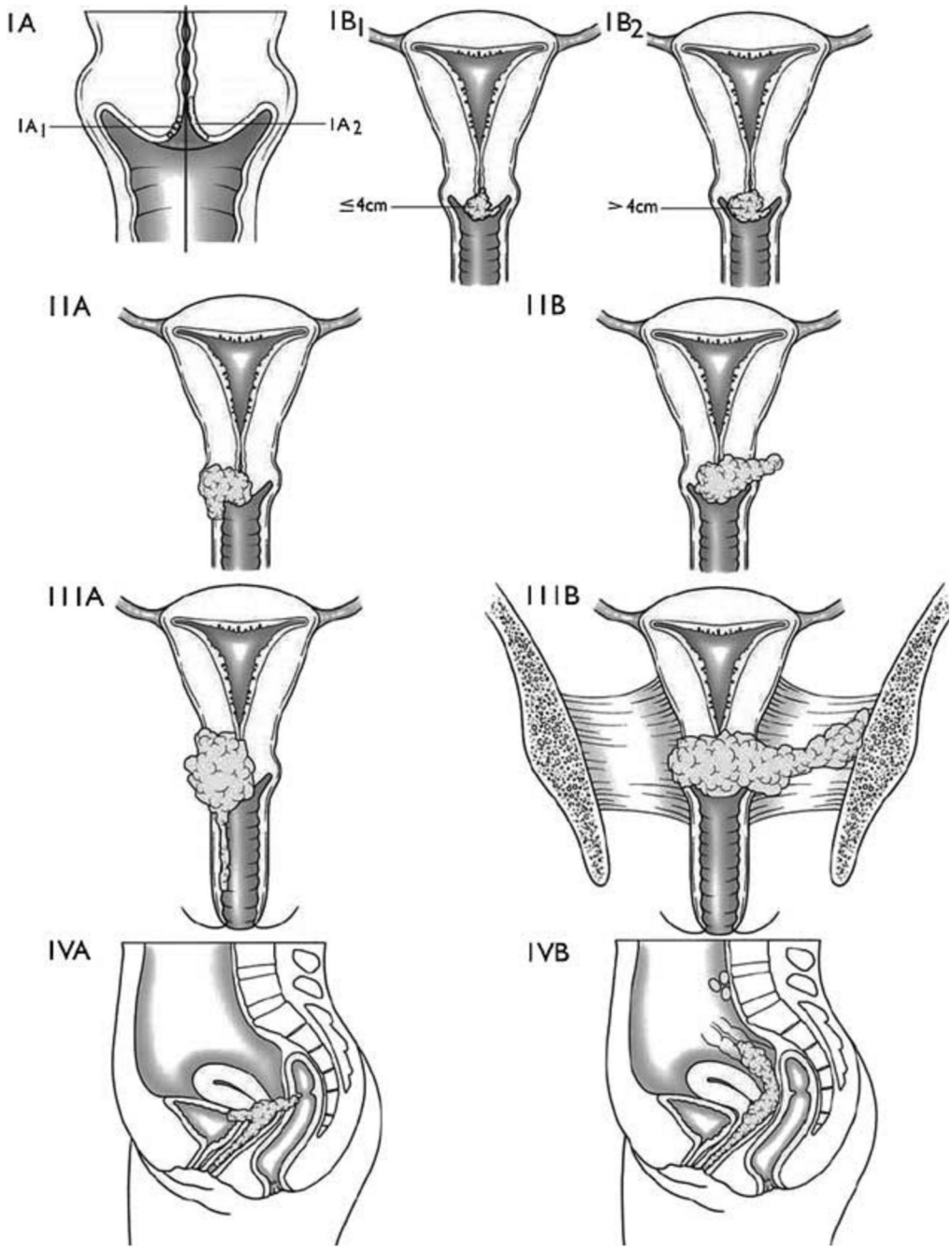

Fig 1 : Staging of Carcinoma Cervix

The following is the recommended investigations for the work up of carcinoma of cervix

Diagnostic work-up for carcinoma of the uterine cervix[16]

General	*History *Physical examination, including bimanual pelvic and rectal examinations
Diagnostic procedures	*Cytological smears(Papanicolaou) if not bleeding *Colposcopy *Conization (subclinical tumor) *Punch biopsies (edge of gross tumor, four quadrants) *Dilatation and curettage *Cystoscopy, rectosigmoidoscopy(stages IIB, III, and IVA
Radiographic Studies	Standard *Chest radiography *Intravenous pyelography *Barium enema (stages III and IVA and earlier stages if there are symptoms referable to colon or rectum) Complementary *Lymphangiography *Computed tomography or magnetic resonance imaging *Positron emission tomography scan(optional)

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Laboratory studies	*Complete blood count *Blood chemistry *Urinalysis

3.3.2 Current role of Imaging

The most important issue in staging cervical cancer is to distinguish early disease (stage 1A and 1B) that can be treated with surgery from advanced disease that must be treated with radiation alone or combined with chemotherapy. Imaging modalities must be directed to solve this clinically important question. Conventional radiological studies such as excretory urography, barium enema and lymphangiography are less commonly used

today. However, there has been an increase in the use of cross-sectional imaging like CT and MRI [17].

Thus, the specific questions that can be answered by imaging for the staging of invasive cervical cancer are a) extension of tumour into the parametrium, pelvic sidewall, bladder and rectum b) presence of hydronephrosis secondary to ureteric obstruction c) detection of lymph nodes and d) detection of local recurrence and distal metastatsis [18].

Transabdominal sonography is a first-line imaging technique for evaluation of the upper and lower abdomen because it is almost universally available, is noninvasive, lacks ionizing radiation, and is well accepted by patients. Sonography of the urinary bladder is a quick method. If ultrasonography is implemented as a triage for bladder infiltration in patients with cervical carcinoma, and only those with a sonar finding suspicious of infiltration are referred for cystoscopy, it would result in a decrease of 60% in the number of cystoscopies without any decrease in diagnostic accuracy [5].

A cost analysis has indicated that this triage is more economical. Giampero et al [4] prospectively assessed the diagnostic capabilities of transabdominal sonography for showing focal bladder wall abnormalities.

Transvaginal ultrasonography has been found to be superior to transabdominal ultrasonography in the visualisation of pelvic pathology [20]. The posterior bladder wall can be easily be inspected by the transvaginal route in the absence of gross vaginal pathology. However, the value of transvaginal ultrasound to detect posterior bladder wall infiltration has not been conclusively investigated yet. In large exophytic cervical tumours, which bleed easily on contact, the transvaginal approach will be impossible.

Endosonography offers two major advantages in the pre-therapeutic examinations of a histologically verified carcinoma of the uterus. Endosonography allows an overview of the size and location of the tumour and an evaluation of the spreading and involvement of adjacent organs. Both add up to a more objective staging of the tumour and, therefore, may cause a more effective therapeutic approach. Especially in cases with endometrial carcinoma, the uterine walls can be visualized either by the well-tolerated method of vaginosonography or by hysterosonography which can be performed only in general anaesthesia.

Applying either endosonographical method, the infiltration depth of the myometrium and involvement of the cervix can be determined, which seems to be very valuable, particularly when differentiating between stages I and II. Rectosonography, with its transversal scanning probes, offers the advantage of

demonstrating the infiltration of a cervical tumour into the parametrium. Here again, the benefit is seen in a more objective evaluation of tumour size and extension.

However, tumour growth into the urinary bladder is best shown by cystosongraphy. With this method one cannot only have a view of the epithelium (as in cystoscopy) but one is also able to evaluate the underlying layers of the bladder wall. This seems to be an advantage in findings of a bullous oedema. Once again, rectosonography is advantageous in enhancing the diagnosis of recurrences of malignant tumours in the pelvic region. Like a prolongation of the palpating finger rectosonography is able to depict less echogenic areas located high up on the pelvic wall as local recurrences or tumours.

Iwomoto et al [21] evaluated the use of transvaginal ultrasonography for diagnosing invasion of the bladder by cervical cancer. A transvaginal transducer was inserted into the anterior fornix of the vagina and the bladder wall was studied in the sagital plane. The movability of the bladder was assessed by the ability of the bladder to slide along the uterine cervix when the probe was pushed up against the bladder from the anterior fornix. Movability was considered to indicate an intact bladder wall. All the patients underwent computed tomography and cystoscopic examination also. Five had magnetic

resonance imaging. The accuracy was 95% for transvaginal ultrasonography, 76% for CT, 86% for cystoscopy and 80% for MRI. They concluded that transvaginal ultrasonographic examination was useful for detecting invasion of the bladder wall by cervical cancer.

Excretory urography is a sensitive test in the detection of urinary obstruction. In the FIGO staging, excretory urography has been considered an integral part of the initial evaluation because the presence of hydronephrosis or nonfunctioning kidney resulting from ureteral obstruction advances the staging to 3B and is of prognostic importance[22]. However, the yield of tumour related abnormalities demonstrated by excretory urography in patients with gynaecological malignancy is low [23,24].

Huang et al retrospectively analyzed correlation between transvaginal ultrasound and bladder wall invasion in different stages of carcinoma of cervix. Disruption of the endopelvic fascia, a thickened bladder wall, changes in the bladder mucosa and interruption of the entire bladder wall were ultrasonographic characteristic demonstrating the sequential stages of bladder wall invasion in this study[4].

de Jonge et al studied the potential of transabdominal ultrasound to demonstrate the presence or absence of bladder infiltration in patients with cervical carcinoma and found that transabdominal ultrasound had a sensitivity of 100%, a specificity of 76.5%, a positive predictive value of 60.4% and a negative predictive value of 100% [6]. In another retrospective study by Sunderborg et al, pelvic computed tomographic(CT) scan findings were correlated with cystoscopic findings in patients with FIGO stage 2B or greater cervical cancer and found that CT scan had a positive predictive value of 60% and negative predictive value of 100% [6].

Computed tomography(CT) has been advocated as a screening tool in evaluation of gynaecologic malignancies because it is noninvasive and may detect disease not found by usual staging methods[25,26,27]. In patients with cervical cancer, CT often is used to determine parametrial involvement, adenopathy, adjacent organ invasion and to help design radiation therapy. CT has staging accuracy ranging from 32% to 80% in cervical cancer. The sensitivity for parametrial invasion ranges from 17% to 100% with an average of 64%. Specificity ranges from 50% to 100% with an average of 81%. There is a consensus in the literature that the value of CT increases with higher stages of disease, and that CT has limited value (a positive predictive value of 58%) in evaluating early parametrial invasion. However, CT has an accuracy of 92% in

depicting advanced disease. The major limitation of CT in local staging is its inadequate differentiation between tumor and normal cervical stroma or parametrial structures. Therefore, CT is mainly used in advanced disease and in the assessment of lymph nodes. The positive predictive value of CT for nodal involvement is 65% with a negative predictive value of 86%. CT is also performed to detect distant metastases, for radiotherapy planning, and for guiding interventional procedures.

Sundborg et al [6] did a retrospective analysis to determine the utility of cystoscopy to rule out bladder invasion in cervical cancer patients who had pelvic CT scan. The positive predictive value of CT scan in predicting bladder invasion was 60 %. The negative predictive value of CT scan in predicting bladder invasion was 100%.

The CT scan criteria for bladder involvement include the focal loss of perivesical fat plane accompanied by asymmetrical wall thickening, nodular indentations along the bladder wall, intraluminal tumour mass and a vesicovaginal fistula [28,29].

Magnetic resonance imaging (MRI) is very accurate in determining tumour size and location, the depth of stromal invasion and the local extension of the tumour. The staging accuracy of MRI ranges from 75% to 96%. In assessing local tumour invasion, T2- weighted images are superior to contrast – enhanced T1- weighted images. Although cross sectional imaging is expensive, it results in net cost savings because it replaces a number of less-expensive procedures [30].

However, in an era of increased cost consciousness, it may be appropriate to estimate the efficacy of each test defined as the probability that it will detect abnormalities suspicious for cancer.

3.3.2 Role of cystoscopy

Invasive cervical cancer may spread to the lower urinary tract by direct invasion. Examination of the ureters and bladder is very important in evaluating the extent of spread. The two methods most commonly used in the evaluation of the urinary tract in cervical cancer patients are excretory urography and cystoscopy. Cystoscopy is being used to establish the diagnosis of bladder invasion. However it is an invasive investigation and may cause several acute urinary symptoms.

Not all patients with cervical cancer need cystoscopy to rule out bladder involvement. Sundborg et al [6] reviewed 49 patients with stage 2B or greater cervical cancer who underwent both cystoscopy and CT scan before treatment. Three patients with bladder invasion were identified by cystoscopy and all were also identified with possible bladder invasion by CT scan. There were two cases of possible invasion seen on CT scan, but subsequent cystoscopy proved no invasion. They concluded that the utility of performing cystoscopy to rule out bladder invasion in a patient with no evidence of bladder involvement on CT scan was limited and might not be necessary.

In another study Liang et al [7] assessed the usefulness of cystoscopy in the staging of cervical tumour. Both rigid cystoscopy and CT were performed before treatment in patients with cervical cancer of FIGO stage IB or greater. Cystoscopically directed biopsy specimens were taken from all areas in the bladder which were suspected of cancerous development. If a jet of urine spurting from each ureteral orifice was not found, a ureteric catheter was inserted into the orifice to rule out ureteral obstruction. The cystoscopic findings were compared with CT examination. A total of 100 patients were included in that study. There were 30 stage IB cancers, 20 stage IIA, 17 stage IIB, 5 stage IIIA, 18 stage IIIB, and 10 stage IV. A total of 90 patients had squamous cell carcinomas and 10 had adenocarcinomas. Cystoscopy identified

eight patients with bladder invasion including one stage IIIA, two stage IIIB, and five stage IV. All of these patients had CT indication of possible invasion. CT indication of possible invasion was proved to be false by cystoscopy in two patients. Both the sensitivity and the negative predictive value of CT for bladder invasion were 100%. Of the 14 patients in whom ureteral obstruction was diagnosed by ureteric catheterization, 11 cases were indicated by CT scan, but for the other 3 patients CT found no significant ureteral obstruction. They concluded that cystoscopy is indicated only in cervical cancer patients for whom CT examination indicates possible bladder invasion.

Therattil DD et al [31] assessed the effectiveness of cysto-urethroscopy for the staging of cervical cancer was evaluated in a review of 412 cases of advanced squamous cell carcinoma. Only 10 of the 378 stage-3 cases and 19 of the 24 stage-4 cases had histopathologically confirmed vesical mucosal involvement. All women underwent radiotherapy, regardless of the cystoscopic finding. Overall, this study suggests that cysto-urethroscopy is an unnecessary, cost-ineffective, invasive procedure that facilitates neither diagnosis nor treatment planning. Transvaginal sonography may be a preferable technique for evaluating vesical invasion, with use of cystoscopy reserved for endoscopic decompression of the obstructed ureter.

MATERIALS AND METHODS

This study was performed in the department of urology, Christian Medical college, Vellore, to assess the usefulness of cystoscopy in comparison to transabdominal ultrasonogram in staging of carcinoma cervix, on 92 adult patients with newly diagnosed carcinoma of cervix with FIGO stage 2B and higher stages. Emphasis was given to any sonographic evidence for bladder involvement. All of them underwent bladder ultrasonography before performing cystoscopy. Transabdominal ultrasound was done and reported in a unified format with particular emphasis for urinary bladder involvement and hydronephrosis. The technique required a full bladder in order to visualize the posterior bladder wall, which then examined by transverse and coronal sections. A normal posterior bladder wall shows up as a smooth echo-dense lining about 3 mm thick. Bladder infiltration is seen as a nodular irregularity.

Study design:

Descriptive

Setting:

Outpatient procedure room of the urology department

Period of recruitment

1st May 2009 to 31st Jan 2010.

Study population:

Ninety two consecutive patients with histologically proven carcinoma of the cervix.

Inclusion Criteria

Patients evaluated in Radiotherapy/Gynaecology OPD and diagnosed to have carcinoma of cervix, FIGO stage 2B and above, were included in this study.

Exclusion Criteria

Ca cervix with FIGO stage lesser than 2B and post radiotherapy patients (recurrent disease and partly treated patients)

Data collection

Personal interviewing of the patient, PACS (Picture Archiving and Communication System) for transabdominal ultrasonogram findings, personal observation of the cystoscopic findings and pathology reports of the bladder biopsy whenever required.

Main outcome measurements:

The findings on transabdominal ultrasonogram and Cystoscopy which were designated as normal, suspicious or infiltration**.**

Parameters observed:

- Age
- Symptoms
  - Haematuria, Discharge PV, Bleeding PV, Bowel symptoms
- Examination findings
  - Performance status
  - Abdomen
  - PV : Parametrium , DRE : Rectal mucosa
- Ultrasonogram findings
- Cystoscopy findings
  - Urethra, Trigone, Bilateral ureteric orifices, posterior wall, any suspicious areas
- Biopsy:
  - Number, Histopathology report
- During cystoscopy any suspicious area in the bladder mucosa which is likely to be involved by the tumour was biopsied. Cystoscopy was done using a rigid cystoscope with field of view of 30° (Karl Storz, Germany) under local anaesthesia. The number, location, and size of the tumours were individually determined, reported on a separate sheet, and then entered into the database after cystoscopy for later comparison with the

sonographic findings. Histologic specimens were fixed in 10% formalin and sent to the pathology department.

Bias: Nil

Sample size:

With a positive predictive value of 60% (as per the previous studies), confidence interval of 95% and precision of 10 % the sample size required in the study group was 92.

Statistical analysis:

SSPS package 16.0 was used to compute the statistical analysis. The cystoscopic findings were compared with sonographic findings and relative values for sensitivity, specificity, positive predictive value, negative predictive value and overall accuracy were calculated. Chi square test were used for quantitative and qualitative type of data.

Sensitivity = True positive cases (TP) / True positive cases + False Negative cases (FN)

Specificity = True negative (TN) / False positive(FP) + True negative

Positive predictive value = TP / TP + FP

Negative predictive value = TN / FN + TN

Overall accuracy = TP + TN / Total number of cases

Ethical Consideration

The institutional Review Board (IRB) considered the study in its ethics committee and cleared the same before the study was started.

RESULTS

Ninetytwo patients were enrolled into the study as per the inclusion criteria. Those with recurrent disease and partly treated with radiotherapy were excluded from the study. All underwent ultrasonogram examination of the abdomen and pelvis before cystoscopy.

5.1 Age

Age	**No**	**%**
30-39	12	13.0
40-49	34	36.9
50-59	28	30.4
60-69	13	14.1
70-79	4	4.3
80-89	1	1.1
Total	92	100

Table 1: Age distribution of the patients

Majority of the patients belonged to fifth and sixth decade. Mean age at presentation was 50.06 with a standard deviation of 10.59.

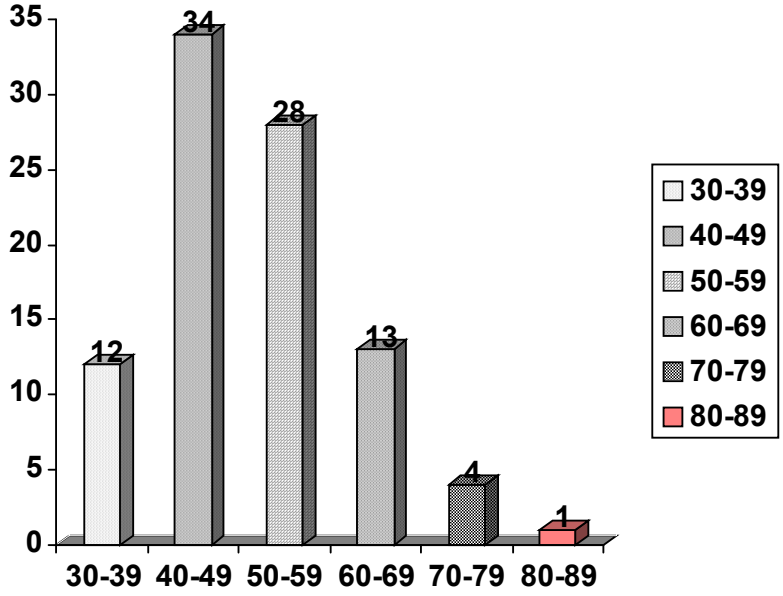

Fig. 2: Bar diagram showing age distribution of the patients

5.2 Symptoms

Symptoms	Number of patients	Percentage
Bleeding PV	79	85.7
Discharge PV	53	57.6
Abdominal pain	32	34.8
Haematuria	3	3.3

Table 2: Clinical presentation of carcinoma cervix patients before evaluation.

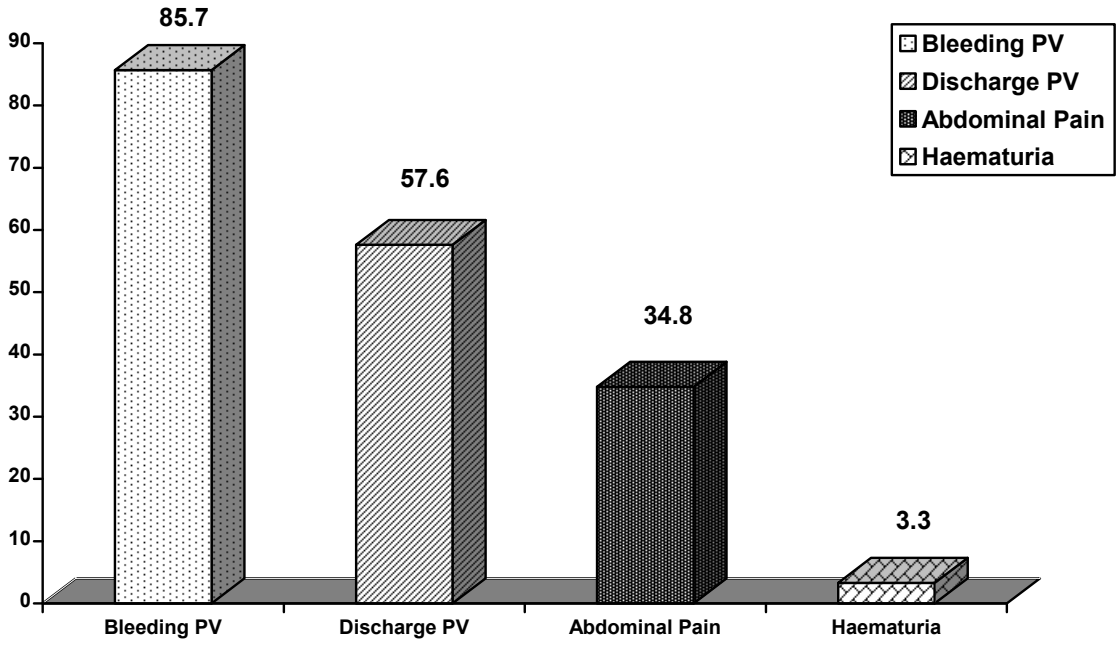

Fig 3. Bar diagram showing the clinical symptoms. X axis showing the different symptoms and Y axis showing the percentage.

Pervaginal bleeding was the main presenting symptom, followed by discharge per vaginum and abdominal pain. Three patients had gross haematuria at the time of presentation.

5.3 Stage of the disease at presentation

All patients were staged based on the clinical findings before subjecting for ultrasonogram and cystoscopy. The distribution of patients according to the stage were as follows.

Stage	Number	Percentage	Cumulative percentage
Stage 2B	35	38.0	38.0
Stage 3A	03	03.3	41.3
Stage 3B	48	52.2	93.5
Stage 4A	06	06.5	100
Total	92	100	

Table 3: Stage of presentation with percentage of each stage.

Most of the patients belonged to stage 2B and 3B. Thirty eight percentage of patients belonged to stage 2B and 52% belonged to stage 3B.

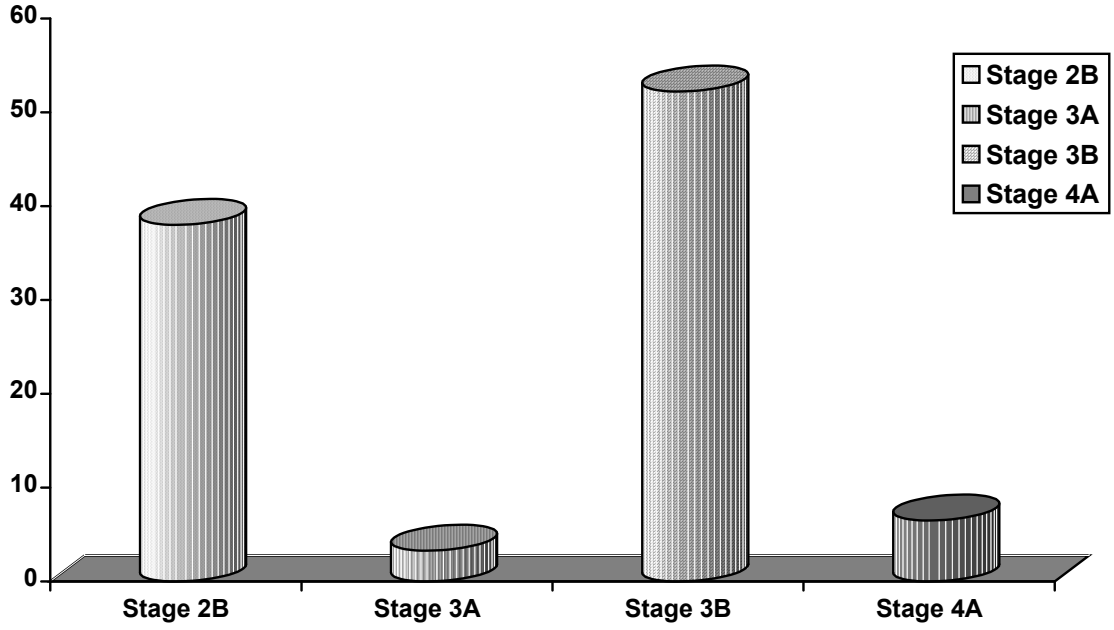

Fig. 4: Clinical stage of presentation with percentage of each stage.

5.4 Bladder Ultrasonogram findings according to the stage.

Thirtyfour patients in stage 2B had normal bladder ultrasonogram finding. There was no bladder infiltration in this stage. All three in stage 3A had normal bladder ultrasonogram finding. Fortyfour in stage 3B had normal bladder whereas four in this stage had suspicious infiltration and one had definite infiltration on bladder ultrasonogram. Of the six in stage 4A four had bladder infiltration and two had normal bladder.

	Normal bladder	Suspicious Infiltrations	Definite Infiltration
Stage 2B	34	00	00
Staghe 3A	03	00	00
Stage 3B	44	04	01
Stage 4A	02	00	04
Total	83	04	05

Table 4: Ultrasonogram of bladder showing the bladder involvement in each stage of carcinoma cervix

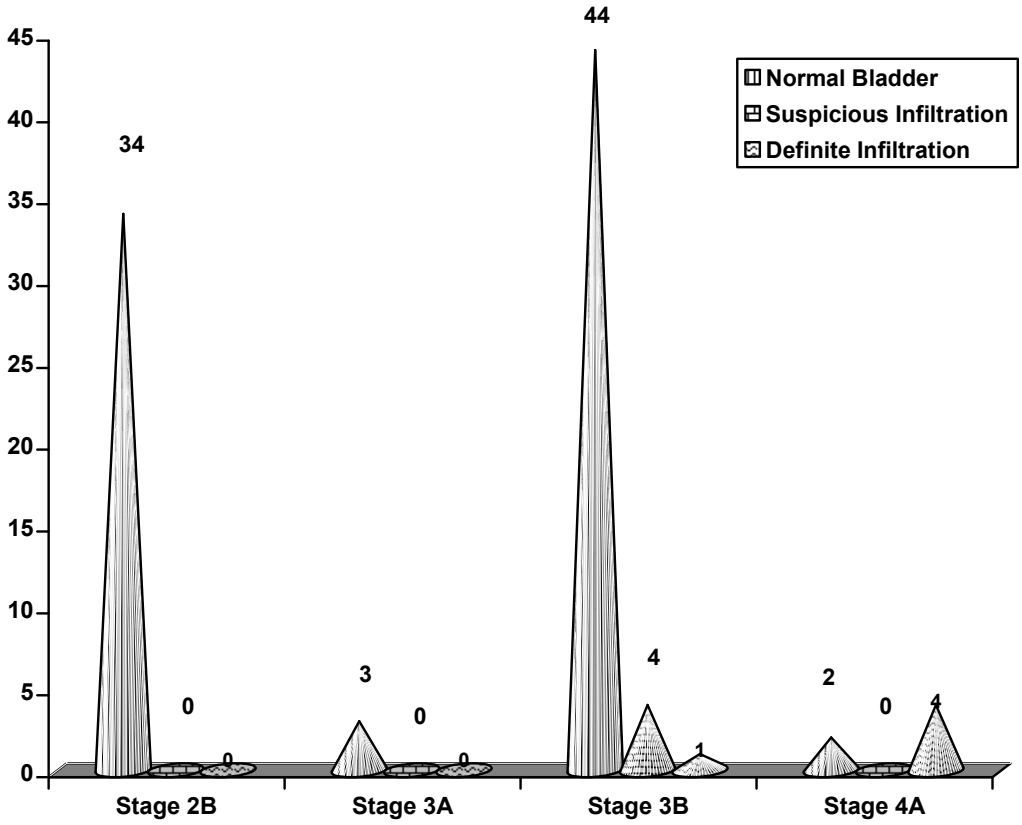

Fig. 5: Ultrasonogram of bladder showing the bladder involvement in each stage of carcinoma cervix

5.4.1 Hydronephrosis according to the stage

Hydronephrosis was present mainly in stage 3B and 4 patients. Only one patient in stage 2B had hydronephrosis.

	No hydronephrosis Number (%)	Unilateral Hydronephrosis Number (%)	Bilateral Hydronephrosis Number (%)
Stage 2B	34 (97.1)	01 (2.9)	00
Staghe 3A	03 (100)	00	00
Stage 3B	36 (73.4)	09 (18.4)	04 (8.2)
Stage 4A	02 (33.3)	03 (50)	01 (16.7)
Total	75 (81.5)	13 (14.1)	05 (4.4)

Table 5. Hydronephrosis (unilateral and bilateral) in in each stage with percentage

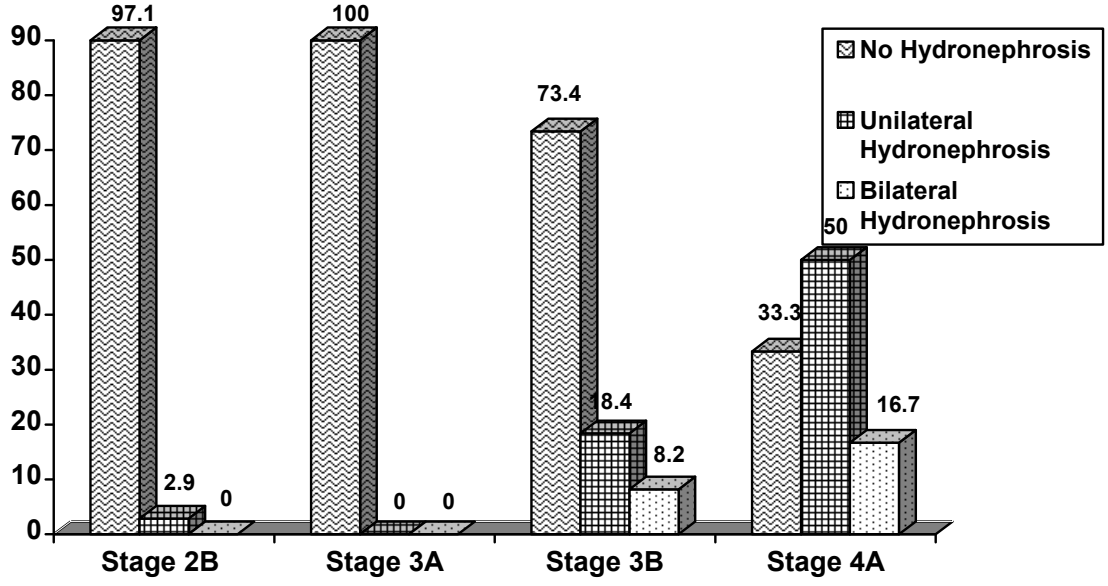

Fig. 6: Hydronephrosis in in each stage

5.5 Hydronephrosis and Cystoscopic findings correlation

	Normal cystoscopy Number (%)	Bladder infiltration on Cystoscopy: Number (%)
No hydronephrosis	73 (83.9)	01(20)
Unilataeral hydronephrosis	10 (11.5)	03 (60)
Bilateral hydronephrosis	04 (4.6)	01 (20)

Table 6: Comparison between ultrasonogram of Kidney and Cystoscopy

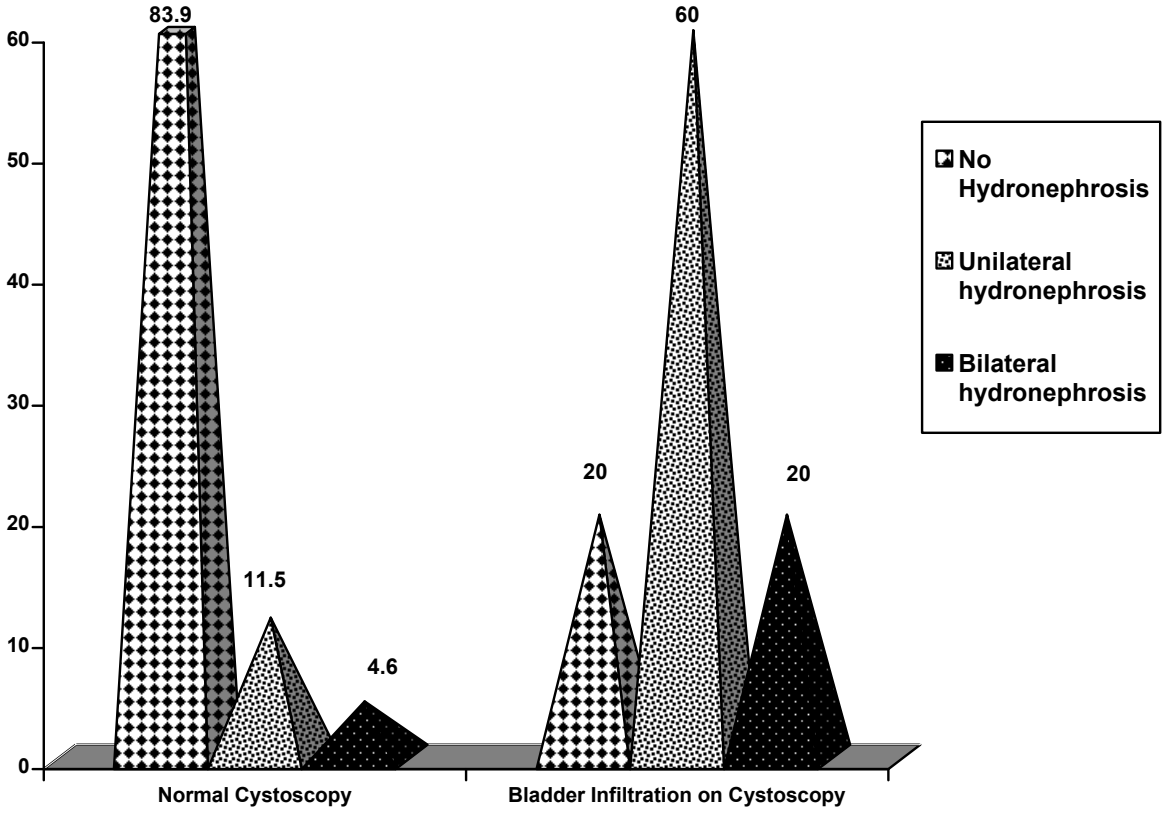

Fig. 7: Comparison between ultrasonogram of Kidney and Cystoscopy

There was no hydronephrosis on transabdominal ultrasonogram in 74 patients (80.4%), of which one had bladder infiltration on cystoscopy. Whereas, of the 18 with hydronephrosis, four had bladder infiltration. Of these, 13 had unilateral hydronephrosis and five had bilateral hydronephrosis. So, presence of hydronephrosis was a predictor of bladder involvement in cervical carcinoma.

5.6 Bladder ultrasonogram and Cystoscopy correlation

	Normal cystoscopy	Suspicious changes on cystoscopy	Bladder infiltration on cystoscopy	Total
Normal USG bladder	78	05	00	83
Suspicious bladder infiltration on USG	02	00	00	02
Definite bladder infiltration on USG	00	02	05	07
Total	80	07	05	92

Table 7. Cystoscopy findings compared to bladder ultrasonogram findings

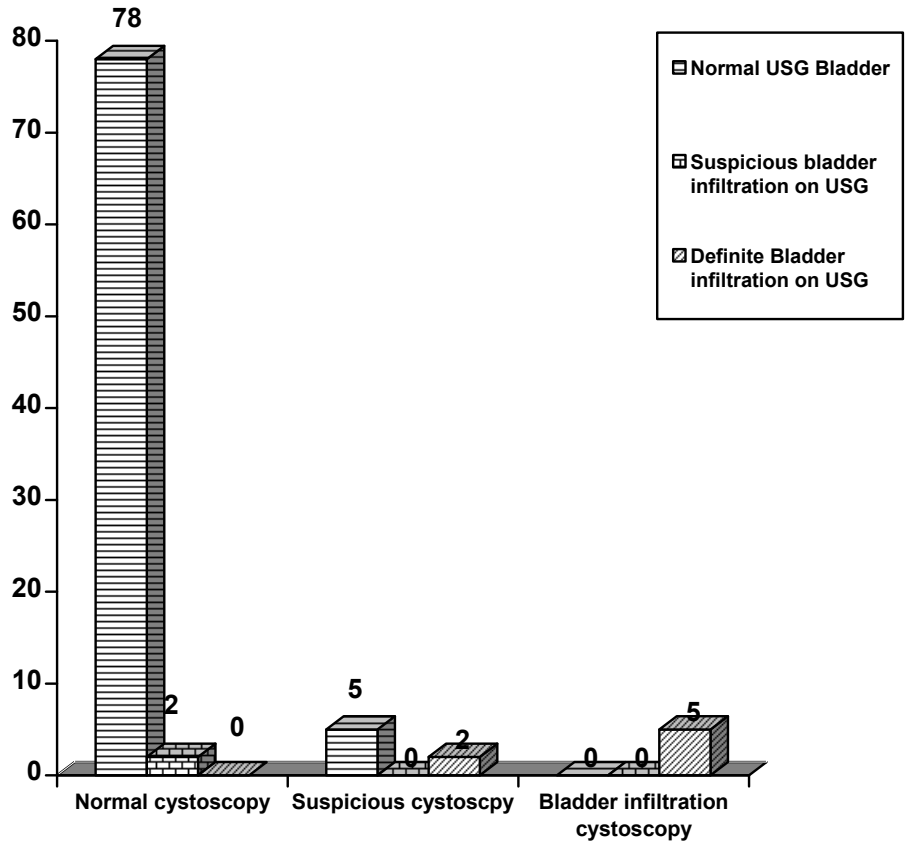

Fig. 8: Cystoscopy findings compared to bladder ultrasonogram findings

Of the 80 with normal cystoscopy findings 78 had normal bladder ultrasonogram and two had suspicious infiltration. Of the seven with suspicious infiltration of bladder on cystoscopy five had normal ultrasonogram and evidence of infiltration. The biopsy report of bladder mucosa in this group was negative for malignant infiltration of bladder. All five with bladder infiltration on cystoscopy had bladder infiltration on ultrasonogram.

		Cystoscopy	
		Positve	Normal
Bladder ultrasonogram	Positive	**05** (true positive)	**04** (false positive)
	Normal	**00** (false negative)	**83** (true negative

P value: 0.0001

Table 8. 2x2 table showing the true positives, false positives, true negatives and false negatives of bladder ultrasonogram findings compared to cystoscopy.

Five had features suggestive of bladder infiltration on ultrasonogram as well as bladder infiltration on cystoscopy (true positive). Four had ultrasonogram features suggestive of bladder infiltration but there was no bladder involvement on cystoscopy (false positive). Eighty three patients had normal bladder ultrasonogram as well as normal cystoscopy (true negative). None of the

patients with normal ultrasonogram had bladder involvement on cystoscopy (false negative).

That is, there were five true positive cases, four false positive cases, 83 true negative and there were no false negative cases. So the sensitivity, specificity, positive predictive value, negative predictive value and accuracy of the ultrasonogram to detect the bladder mucosal involvement were calculated as follows.

Sensitivity:	5 / 5+ 0 x 100	=	**100%**
Specificity:	83 / 83 + 4 x 100	=	**95.4%**
Positive predictive value:	5/ 5 + 4 x 100	=	**55.55%**
Negative predictive value:	83 / 83 + 0 x 100	=	**100%**
Overall accuracy :	83+ 5 / 92 x 100	=	**95.6%**

The prevalene of bladder infiltration was 5.4%.

5.7 Haematuia and Ulrasonogram

	Normal cystoscopy	Bladder infiltration
With haematuria	00	03 (3.3%)
Without haematuria	89 (96.7%)	00

p value =0 .0001

Table 8. Cystoscopy findings in relation to haematuria at the time of presentation

All the three patients who presented with gross haematuria had bladder infiltration on cystoscopy. This shows that haematuria can be taken a s a predictor for bladder involvement in cervical carcinoma.

DISCUSSION

Accurate staging before instituting definitive therapy in carcinoma of the cervix is very important. Cystoscopy is being conventionally done to rule out any bladder involvement. However, studies which specifically investigated the role of transabdominal ultrasonography in the diagnosis of bladder infiltration by cervical carcinoma are very limited. The aim of this study was to assess the usefulness of cystoscopy in staging of carcinoma cervix and to determine the potential of transabdominal ultrasonography to demonstrate the presence or absence of bladder infiltration in patients with cervical carcinoma.

There were 92 patients in this study which is comparable to sample size in similar study [6]. Of the 92, 35 belonged to clinical stage 2B, three were stage 3A, 49 were stage 3B and six were stage 4A. In a similar study by de Jonge et al [6] the stage distribution was 39, 27 and 29 in stage 2, stage 3 and stage 4 respectively. In our study maximum number of patients were in stage 3 and the number of patients in stage 4 were lesser compared to the other study.

In our study sensitivity, specificity, positive predictive value, negative predictive value and accuracy of ultrasonogram in the detection of bladder

involvement were 100%, 95.4%, 55.5%, 100% and 95.6% respectively. In the prospective study by de Jonge et al the corresponding values were 100%, 76.5%, 60.4%, 100% and 82.7% respectively. These findings were similar to our study. In that study there was no false negative cases which was similar to our result. The high sensitivity and negative predictive value can be attributed to the advancement in the imaging technology. With a negative predictive value of 100%, ultrasonogram can be strongly considered to rule out bladder involvement in cervical carcinoma patients. As there was no false negative cases, the issue of missing any lesion on ultrasonogram becomes negligible.

Deo SV et al [8] assessed the role of transabdominal pelvic ultrasound (TAPUS) and computed tomography (CT) in the detection of bladder involvement in advanced cancer of the cervix. TAPUS was performed in 65 patients and CT in 60 patients. Cystoscopy was performed in all patients and the findings were taken as the gold standard for comparison of imaging data. The sensitivity, specificity and accuracy of TAPUS were 65, 94 and 75% respectively, while those for CT were 80,92 and 85% respectively. This was comparable to the results of our study. They concluded that the accuracy of TAPUS was comparable to the accuracy of other imaging modalities in the detection of bladder involvement in cervical cancer and that it should be used more frequently in developing countries that deal with a large number of

cervical cancer patients in view of its easy availability, low cost and absence of exposure to radiation.

Giampiero et al [19] observed that the sensitivity, specificity, positive predictive value, negative predictive value and overall accuracy of transabdominal ultrasonogram to detect focal bladder wall abnormalities were 91.4%, 79.3, 91.4, 79.3 and 88.2% respectively**.** The sensitivity and negative predictive values in our study was better than this study. The prevalence of bladder infiltration in our study was 5.4%. In the prospective study by de Jongo et al [5] the prevalence was 26.4%. There was significant decrease in bladder infiltration of carcinoma cervix patients in our study.

If noninvasive modalities can be instituted for staging and which can replace the conventional invasive methods, it will improve patient comfort as well as delay in getting the test done. The issue is how accurate the tests are. One area which require improvement in the case of transabdominal ultrasonogram to detect bladder infiltration in cervical carcinoma is to minimize the false positive cases. Having said that, at the same time it should not compromise sensitivity of the imaging modality. This can be accomplished with improvement in technology. Improved specificity is important to avoid inappropriate palliative

treatment in situations where radical treatment is indicated. At the same time, a more favourable positive predictive value could bring down the number of patients who need cystoscopy to verify an ultrasonographic finding of infiltration. This would add to the cost-effectiveness of bladder ultrasonography. As the prevalence of bladder infiltration was low in our series, further studies with larger sample size may be helpful to arrive at better conclusion.

CONCLUSION

In this study **"**Does Pretreatment Cystoscopy improve Staging in Carcinoma Cervix?" it was found that the incidence of bladder infiltration due to cervical carcinoma was 5.4%. Those who presented with haematuria had bladder invasion on transabdominal ultrasonogram and confirmed by cystoscopic bladder biopsy. Those with hydronephrosis had 15.8 times more possibility of having bladder infiltration. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of ultrasonogram in the detection of bladder involvement were 66.7%, 94.38%. 28.57%, 98.8% and 93.55% respectively.

Transabdominal ultrasonogram is a useful triage method for the evaluation of the bladder for infiltration by cervical carcinoma. It has an excellent sensitivity and negative predictive value in detecting bladder involvement. There was no false negative cases. Hydronephrosis and gross haematuria were predictors of bladder involvement. All presented with haematuria had bladder infiltration. Based on the findings of our study, we recommend the use of transabdominal ultrasonography of the bladder as a screening test for bladder infiltration by cervical carcinoma. Cystoscopy may be performed in those with abnormal findings on ultrasonography. This is more

cost-effective, non-invasive and less time consuming. This will avoid cystoscopy in all patients with cervical carcinoma and cystoscopy can be tailored to those with ultrasonogam findings suggestive of bladder carcinoma. This approach is highly appropriate for countries with high incidence as well as delayed presentation of cervical carcinoma.

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PROFORMA

Proforma for study on " Does Pretreatment Cystoscopy Improve Staging in Carcinoma Cervix"

Name : Age :

Hosp. Number :

Address :

Phone number :

Symptoms :

Haematuria

Bowel symptoms :

Abdominal Pain :

Bleeding PV :

Duration of Symptoms :

Co morbidities : DM HTN

Physical Examination :

Height : Weight : BMI :

Performance status(ECOG) :

Abdomen : Flank tenderness: Yes / No

Mass :

Per Vaginal Examination :

Fornices : Right : Left :

Parametrium Right : Left :

Rectal Examination : Rectal mucosa :

Investigations:

Urine microscopy :

Serum Creatinine :

Cervical Biopsy report **:**

Stage of the disease :

USG findings :

Hydronephrosis Right : Left :

Bladder involvement : No infiltraion

Suspicious of infiltration

Suggestive of infiltration

Rectal involvement :

Cystoscopy findings :

Urethra :

Ureteric orifices: Right : Left :

Trigone : Normal :

Suspicious :

Definitive lesion :

Other areas of bladder :

Bladder biopsy :

Number

Sites :

INFORMED CONSENT DOCUMENT

I,Mrs.----------, aged --------years, daughter of----------, resident of ---------- have consented to undergo cystoscopy as part of the treatment for a diagnosed medical condition understanding that the findings will benefit me in my treatment. I understand that photographs and/or video or

electronic recordings may occur or data collected during my procedure may be used for internal performance improvement or educational purposes.

I hereby state that I am in no way coerced into participating in this study and am participating of my own free will.

I have read this document or someone has explained the contents of this document to me in a language I understand.

Signed :

Name :

Date :

Place :

Name and Signature of Doctor with Date

SLNO	NAME	HOSPNO	AGE	HEMATU	BLEEDING	ABDPAIN	DISCHARG	STAGE	USGB	USGK	CT	MRI	CYSTO	BIOPSY		
1	Velmizhi	454794D	40	0	1	0	0	3	1	1	3	1	1	1		
2	JayaLakshmi	452670D	45	0	1	0	0	3	1	1	3	1	1	1		
3	Arputham	306779B	60	0	1	0	0	1	1	1	2	1	1	1		
4	Kanthammal	460903D	79	0	1	1	0	3	1	1	2	1	1	1		
5	Hena Sarkar	502770C	52	0	1	0	0	3	1	1	2	1	1	1		
6	MohanBai	471842D	60	0	1	0	0	3	1	1	2	1	1	1		STAGE
7	Kannammal	476067D	56	0	1	0	0	1	1	1	2	1	1	1		1 2B
8	Minroy	480915D	44	0	1	0	0	3	1	1	2	1	1	1		2 3A
9	Lakshmi	459951D	55	0	1	1	0	3	2	3	2	1	1	1		3 3B
10	Kerelyn	458841D	53	0	1	1	0	3	1	1	2	1	1	1		4 4A
11	Taru	485972D	49	0	1	1	0	3	1	1	2	1	1	1		
12	Rajammal	486245D	59	0	1	1	0	3	1	1	2	1	1	1		USGB(USG BLADDER)
13	Saralin	484746D	33	0	1	1	0	1	1	1	2	1	1	1		1 NORMAL
14	Therasamma	495131D	48	0	1	0	0	1	1	1	2	1	1	1		2 SUSPICIOUS INFILTRATION
15	Asefa	486302D	43	0	1	0	0	1	1	1	2	1	1	1		3 INFILTRATION
16	Tilsley	084807C	81	0	1	0	0	2	1	1	1	1	2	2		
17	Janakiammal	471118D	62	0	1	0	0	1	1	1	1	1	1	1		USGK(USG kidney)
18	Visuasam	479058D	54	0	1	1	0	3	1	2	1	1	1	1		1 no hydronephrosis

19	Karpagam	499205D	41	0	1	0	0	3	1	1	1	1	1	1		2 UNILATERAL HUN
20	Lakshmi	325141D	41	0	1	0	0	2	1	1	1	1	1	1		3 BILATERAL HUN
21	Nagapushanam	488601D	51	0	1	0	0	3	1	1	1	1	1	1		
22	Chanchla	035229D	32	0	1	0	0	1	1	1	1	1	1	1		CT
23	Thangammal	510268D	55	0	1	0	0	3	1	1	1	1	1	1		1 NOT DONE
24	Gita Devi	513696D	52	0	0	0	0	1	1	1	1	1	1	1		2 NORMAL CT
25	Upneti Kumar	524336D	42	0	1	0	0	3	1	1	1	1	1	1		3 INFILTRATION OF BLADDER
26	Radhammal	503840D	40	1	1	0	0	4	3	1	1	1	3	3		
27	Srirangam	511132D	55	0	1	0	0	3	2	3	1	1	1	1		MRI
28	Chandra	499553D	38	0	1	0	0	3	1	1	1	1	2	2		1 NOT DONE
29	Nagarathinam	495354D	65	0	1	0	0	3	1	1	1	1	1	1		2 NORMAL
30	Amsa Mary	507772D	45	0	1	1	0	3	1	1	1	1	2	2		
31	Subbulakshmi	502736D	48	0	0	0	0	1	1	1	1	1	1	1		CYSTO(CYSTOSCOPY)
32	Kanniammal	086264B	40	0	1	0	0	3	1	1	1	1	1	1		1 NORMAL
33	Binapani	111778C	62	0	1	0	0	3	1	1	1	1	1	1		2 SUSPICIOUS
34	Dhanam	537981D	53	0	1	0	0	3	1	2	1	2	1	1		3 INFILTRAION
35	Geeta Devi	513696D	52	0	1	0	0	1	1	1	1	1	1	1		
36	Shanthi	055452B	38	0	0	0	0	1	1	2	1	1	1	1		BIOPSY
37	Malliga	529031D	55	0	0	0	0	3	1	1	1	1	1	1		1 NOT DONE
38	Navaneetha	523621D	45	0	1	0	0	3	1	1	1	1	1	1		2 NORMAL BIOPSY

39	Koteswary	468117D	50	0	1	0	0	3	1	1	1	1	1	1		3 MALIGNANT INFILTRATION
40	Mita Mukherji	536005D	38	0	1	0	1	1	1	1	1	1	1	1		
41	Saritha Mishra	542485D	40	0	1	1	1	1	1	1	1	1	1	1		
42	Kamala	540952D	72	0	1	1	1	1	1	1	1	1	1	1	HEMATU	
43	Jamuna	521011D	50	0	1	1	1	3	1	1	1	1	1	1	ABDPAIN	
44	Malliga	489564D	51	0	1	0	1	1	1	1	1	1	1	1	USGB	
45	Rajeswari	532777D	59	0	1	0	1	1	1	1	1	1	1	1	USGK	
46	Kalaiselvi	508536D	42	0	0	0	1	1	1	1	1	1	1	1	CT	
47	Sadhana Saha	565057D	61	0	1	1	1	1	1	1	1	1	1	1	CYSTO	
48	Chinnammal	271247D	66	0	0	0	1	1	1	2	1	1	1	1		
49	Saroja	552166D	65	0	0	0	1	3	1	1	1	1	1	1		
50	Kuppamma	802894B	40	0	0	0	1	3	1	1	1	1	1	1		
51	Vijaya	560298D	43	0	1	1	1	4	1	2	1	1	1	1		
52	Shanthi	558251D	38	0	0	0	1	1	1	1	1	1	1	1		
53	Doli Mukherji	550577D	46	0	0	1	1	1	1	1	1	1	1	1		
54	Umarani	557345D	48	0	1	0	1	1	1	1	1	1	1	1		
55	Lalitha	545601D	37	0	1	0	1	3	1	1	1	1	1	1		
56	Anwara Begum	561521D	48	0	0	1	1	3	1	1	1	1	1	1		
57	Meenakshi	557818D	55	0	1	0	1	3	1	1	1	1	1	1		
58	Chandravathi	568052D	47	0	1	0	1	1	1	1	1	1	1	1		

59	Devaki	567537D	38	0	0	1	1	3	1	1	1	1	1	1		
60	Sundari	561420D	60	0	1	1	1	1	1	1	1	1	1	1		
61	Santhamani	587673D	41	0	1	0	1	1	1	1	1	1	2	2		
62	Sarojini	563643D	55	0	1	0	1	1	1	1	1	1	1	1		
63	Parvathi Devi	562204D	55	0	1	0	1	1	1	1	1	1	1	1		
64	Ratna Singh	432743D	44	0	1	1	1	1	1	1	1	1	1	1		
65	Kanchana Kundu	574696D	67	0	1	1	1	3	1	2	1	1	1	1		
66	Bithi Deb	580560D	62	0	1	0	1	3	1	1	1	1	1	1		
67	Rehana	561698D	45	0	1	1	1	4	3	2	1	1	3	3		
68	Subbamma	576491D	73	0	1	0	1	3	3	2	1	1	3	3		
69	Vijiya	576326D	43	0	1	0	1	3	1	1	1	1	1	1		
70	Salima Bibi	584442D	52	0	1	1	1	3	1	2	1	1	1	1		
71	Margarate Mary	568467D	41	0	1	1	1	3	1	1	1	1	1	1		
72	Chitra	575277D	40	0	1	0	1	1	1	1	1	1	1	1		
73	Rekha Dutta	601239D	61	0	1	1	1	3	1	2	1	1	1	1		
74	Chandra	577451D	40	0	1	0	1	1	1	1	1	1	1	1		
75	Bhagya	593345D	35	0	1	0	1	3	1	1	1	1	1	1		
76	Saroja	590080D	50	0	1	0	1	3	1	2	1	1	1	1		
77	Jayanti	592002D	52	1	1	0	1	4	3	3	1	1	3	3		
78	Radhamani	518473C	45	0	1	1	1	1	1	1	1	1	2	2		

79	Annammal	590263D	54	0	0	1	1	3	1	1	1	1	1	1		
80	Putuli Soren	598122D	42	0	1	0	1	1	1	1	1	1	1	1		
81	Thavamani	910048C	56	1	1	1	1	4	3	2	1	1	3	3		
82	Mita Burman	594616D	58	0	1	0	1	1	1	1	1	1	1	1		
83	Kasturi	601232D	39	0	1	1	1	3	1	1	1	1	1	1		
84	Chinnaponnu	598130D	55	0	1	1	1	4	1	1	1	1	1	1		
85	Sumitra Devi	302388C	73	0	1	0	1	1	1	1	1	1	1	1		
86	Kumari	599665D	60	0	0	1	1	3	2	3	1	1	2	2		
87	Chitra	611666D	45	0	1	0	1	1	1	1	1	1	1	1		
88	ManjuSingh	610452D	46	0	1	1	1	3	1	2	1	3	1	1		
89	Seetha	611006D	35	0	1	1	1	3	1	1	1	1	1	1		
90	Jyotsna	617517D	55	0	1	0	1	2	1	1	1	1	1	1		
91	Maheswari	614204D	40	0	1	0	1	3	1	2	1	1	1	1		
92	Vasanthi	610938D	30	0	1	1	1	3	2	3	1	1	2	2		